Data Analysis *Teacher's Guide*

Students analyze downloaded data using statistical analysis, tables and graphs.

GRADE LEVEL: 9th – 12th

SUBJECT AREA/COURSE: Chemistry, Environmental Science, Math

SUNSHINE STATE STANDARDS:
- Describe changes in ecosystems resulting from seasonal variations, climate change and succession. (SC.912.L.17.4)
- Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems. (SC.912.L.17.7)
- Discuss the need for adequate monitoring of environmental parameters when making policy decisions. (SC.912.L.17.13)
- Discuss the effects of technology on environmental quality. (SC.912.L.17.15)
- Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution. (SC.912.L.17.16)
- Describe how human population size and resource use relate to environmental quality. (SC.912.L.17.18)
- Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability. (SC.912.L.17.20)
- Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data. (MA.912.S.3.3)
- Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data. (MA.912.S.3.9)

ACADEMIC OUTCOMES/LESSON OBJECTIVES:
- Students will create a data table using the atlas website and spreadsheet and word processing programs.
- Students will calculate the mean value of water quality data from the website.
- Students will determine the effect of outliers on the mean.
- Students will determine the quality of water for a given lake by analyzing three different mean values.

TEACHER BACKGROUND INFORMATION: Practice the student activity using Lake Tarpon and Lake Seminole then explore the web pages of lakes near your school to see which will fit your needs. Not all lakes will have data for dissolved oxygen and for nitrogen (Total Kjeldahl Nitrogen-TKN) for the same period of time. You may want your students to start with Lake Tarpon, since it matches the example graph, or begin with nearby lakes you have selected.
Fecal coliform is used in the table as an example of pollution. Not all lakes will have this information for all dates. Access this information through the Data Download tool under Research in the main menu. Add it to the list of parameters if data is available.
You may want to choose different water quality parameters. Check to be sure there are values recorded for the lake and time period you select.

MATERIALS NEEDED: Internet access with a bookmark for www.pinellas.wateratlas.org, Word and Excel or equivalent programs.

SAFETY: N/A

VOCABULARY: parameter, mean, average, outlier

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